MORTALITY AMONG INFANTS AND PRESCHOOL CHILDREN

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ABSTRAK

Pencatatan dan pelaporan kematian telah dilakukan secara prospektif selama satu tahun, di Kabupaten Sukabumi, pada tahun 1982 - 1983. Dalam kurun waktu tersebut tercatat angka kematian untuk semua golongan umur sebesar 10,7 %. , angka kematian Balita (0 - 4 tahun) sebesar 31,7 %. dan angka kematian bayi 75 per 1000 kelahiran hidup.

Penyebab kematian utama pada anak umur 1 - 4 tahun adalah pneumonia 415,2; diare 272,8; tifus perut 225,4; dan campak 83,0 per 100.000 anak. Kurang gizi merupakan pendamping dari penyakit yang menyebabkan kematian.

Pada bayi umur 1 - 11 bulan, penyebab kematian yang utama adalah pneumonia 1106,4; diare 510,6; campak 340,4; meningitis 340,4; batuk rejan 297,9 dan tetanus 212,8 per 100.000 bayi lahir hidup. Kurang gizi sering merupakan pendamping dari penyakit yang menyebabkan kematian.

Kematian pada bayi umur kurang dari 1 bulan, umumnya disebabkan tetanus 1574,5; immaturitas 851,1; hypoxia atau asphyxia 425,5 per 100.000 bayi lahir hidup.

Untuk menurunkan angka kematian bayi dan anak 1 - 4 tahun, cakupan immunisasi pada ibu hamil dan bayi serta anak 1 - 4 tahun perlu ditingkatkan; di samping mengadakan latihan tentang perawatan tali pusat.

Penyuluhan tentang hygiene dan sanitasi perlu ditingkatkan untuk mencegah timbulnya penyakit menular.

INTRODUCTION

Infant and childhood mortality are sensitive indicators to evaluate the community health status. In Indonesia, infant mortality rates were estimated indirectly from intercensal survey and population census 1980, by the Central Bureau of Statistics. Estimated infant mortality rate, based on 1980 population census, was 107 infant deaths per 1000 live births, which consisted of 86 deaths and 113 deaths per 1000 live births, respectively in the urban and rural area. In West Java, infant mortality was 129 deaths per 1000 live births, consisting of 105 and 134 deaths respectively in the urban and rural area.[1]

The National Health Development plan regarding Health for All by the year 2000, is directed to reduce infant mortality rate to 45 per 1000 live births, and mortality among preschool children reduced to 15 per 1000 children under 5 years of age.

Causes of death are important for planning the intervention strategy, especially the underlying cause of a disease process that leads to death.

Mortality data derived from hospitals and health centers are incomplete, since most cases never had any consultation to a health center or hospital; besides that health centers and hospitals identify only the direct causes of death for recording.

A prospective study was carried out in Sukabumi regency, West Java province, with the objective to find mortality pat-

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tern and the underlying causes of deaths among children under 5 years of age.

MATERIAL AND METHODS

The mortality study was started on 1 September 1982 and continued through 31 August 1983. The data were collected prospectively by the community leaders who were usually concerned about any event occuring in the neighbourhood. Each neighbourhood consisted of ± 35 household.

Community leaders were elected by the community, who were mostly not illiterate, although they had low education. In order to meet their capability, the death recording form was written in local dialect, and limited to simple questions such as age, sex, layman cause of death and easily recognized symptoms.

Meeting with the community leaders were conducted monthly for the first quarter and followed by quarterly meettings, in order to motivate the participation and also discuss about problems arising from the recording and reporting.

These death recording forms were collected once a week by health workers. Then each case was followed up by a specially assigned medical doctor, who subsequently make a home visit to verify death and the probable cause of death.

A death might have more than one cause :

(a). Direct cause : the cause leading directly to death.

(b). Intervening antecedent cause : conditions which unfavourably influenced the course of a morbid process, and this contributed to the fatal outcome, but which was not related to the disease or condition directly causing death.

(c). Main cause : one of the above mentioned diseases which was communicable or preventable and was of concern to decision maker in the Ministry of Health.

The diseases were classified according to the modified mortality list from the Ninth Revision of the International Classification of Diseases.

The sample population consisted of 63817 people living in the two subdistricts, i.e. Parakan Salak and Jampang Kulon.

RESULTS

The mortality study revealed 683 death within one year period with a crude death rate of 10.7 per 1000 population were reported. Infant deaths were 176 or 75.0 per 1000 live births. Among the infant deaths, 90 were neonatal deaths or 38.3 per 1000 live births. The mortality rate among children of 0 - 5 years old was 31.7 % per 1000 children, or among children aged 1 - 4 years was 14.2 per 1000 children (Table 1).

The reported causes of deaths among children of 1 - 4 years old showed infectious and parasitic diseases were the main causes of 771.1 deaths per 100,000 children. Among these, the major diseases were diarrhoea, typhoidfever and measles with mortality rate of 272.8, 225,4 and 83.0 deaths per 100,000 children respectively. the other prevalent diseases was pneumonia, causing 415.2 deaths per 100,000 children. Nutritional deficiencies were prevalent as an associated cause of 225.4 deaths per 100,000 children (Table 2).

The infant mortality rate of 1 - 11 months old was 36.6 per 1000 live births. Infectious and parasitic diseases caused 1446.8 deaths per 100,000 live births. Among these, the major diseases were diarrhoea,

Table 1 Death Rates by specific age groups.

Specific groups	Population	Death	Rate per 1000
Neonatal (< 1 month)	2348 *	90	38.3
Infants (0 — 1 yr)	2348 *	176	75.0
Preschool (0 — 4 yrs)	9335	296	31,7
All age	63817	683	10.7

* Number of live births

Table 2 Main cause and associated cause of death among children aged 1 - 4 years

C a u s e	Main Cause Number	Rate*	Associated cause Number	Rate*
All causes	120	1423.48	—	—
Infectious and parasitic diseases	65	771.1	8	94.9
Diarrheal disease	23	272.8	3	35.9
Typhoid fever	19	225.4	—	—
Tuberculosis	3	35.6	—	—
Diphtheria	3	35.6	1	11.9
Whooping cough	3	35.6	—	—
Tetanus	2	23.7	—	—
Septicaemia	—	—	—	—
Measles	7	83.0	1	11.9
Other infectious and parasitic diseases	5	59.3	4	47.4
Leukaemia	1	11.9	—	—
Nutritional deficiencies	1	11.9	19	225.4
Meningitis	1	11.9	—	—
Influenza	—	--	7	83.0
Pneumonia	35	415.2	12	142.3
Bronchitis, emphysema and asthma	5	59.3	4	47.4
Chronic liver diseases and cirrhosis	2	23.7	—	—
Nephritis, nephrotic syndrome and nephrosis	1	11.9	—	—
Injuries	3	35.6	1	11.9
Fever of unknown origin	3	35.6	—	—
Ill-defined conditions	3	35.6	1	11.9

* Rate per 100.000 children aged 1 - 4 years (N = 8430).

measles, whooping cough and tetanus with death rates of 510.6, 340.4, 297.9 and 212.8 deaths per 100,000 live births respectively. Deaths caused by other important diseases were pneumonia 1106.4, meningitis 340.4 and fever of unknown origin 255.4 per 100,000 live births. Nutritional deficiencies was a major associated cause of death resulted in 212.8 deaths per 100,000 live births (Table 3).

Table 3 Main and associated cause of deaths among infant 1 - 11 months

Cause	Main Number	Cause Rate*	Associated Cause Number	Rate *
All cause	86	3659.6	—	—
Infectious and parasitic diseases	34	1446.8	4	170.2
Diarrheal disease	14	510.6	1	42.6
Typhoid fever	—	—	1	42.6
Tuberculosis	—	—	1	42.6
Whooping cough	7	297.9	1	42.6
Tetanus	5	212.8	—	—
Measles	8	340.4	—	—
Nutritional deficiencies	3	127.7	5	212.8
Meningitis	1	42.6	—	—
Influenza	1	42.6	8	340.4
Pneumonia	26	1106.4	16	680.9
Bronchitis, emphysema and asthma	—	—	2	85.1
Congenital anomalies	4	170.2	1	42.6
Immaturity	1	42.6	—	—
Fever of unknown origin	6	255.4	—	—
Ill-defined conditions	3	127.7	—	—

* Rate per 100.000 live birth (N = 2350).

The death rate of newborn babies, less than 1 month old, showed that infectious and parasitic diseases were the main causes of deaths with 1702.1 death as per 1000 live births, among which tetanus was the major causes of 1574.5 deaths per 100,000 live births. The other frequent causes of deaths were immaturity 851.1, and hypoxia, birth asphyxia and other respiratory conditions (425.5) per 100,000 live births as main causes, and 808.5 deaths per 100,000 live births as associated causes (Table 4).

DISCUSSION

The mortality study in Sukabumi showed a crude death rate of 10.7 %, which was slightly lower than 12.1 % from the Household Health Survey 1980 and estimated 12.5 % from the Intercensal Survey and Population Census 1980. The age specific death rate of Children under 5 years, was 31.7 %. (SE O. 18), compared to the estimated rate of 37.1 % from the Household Health Survey 1980[3].

The infant mortality rate in the study area was 75.0 %. live births. compared

Table 4 Main cause and associated cause of death among new borns aged less than 1 month

Cause	Main Number	Cause Rate*	Associated Number	Cause Rate*
All cause	90	3829.8	—	—
Infectious and parasitic diseases	40	1702.1	2	85.1
Diarrheal disease	2	85.1	—	—
Tetanus	37	1574.5	—	42.6
Septicaemia	1	42.6	1	42.6
Other infectious and parasitic diseases	—	—	1	42.6
Nutritional deficiencies	3	127.7	1	42.6
Influenza	—	—	1	42.6
Pneumonia	4	170.2	3	127.7
Congenital anomalies	2	85.1	—	—
Perinatal causes	34	1446.8	24	1021.3
Affected by complications of labour and delivery	2	85.1	2	85.1
Birth trauma	1	42.6	1	42.6
Hypoxia, birth asphyxia and othe respiratory conditions	10	425.5	19	808.5
Haemolytic disease of fetus of newborn	1	42.6	—	—
Immaturity	20	851.1	2	85.1
Fever of unknown origin	7	297.9	—	—

* Rate per 100.000 live births (N = 2359 2350).

to 99.9 %. live births from the Household Health Survey 1980, or 134 %. live births in rural West Java[1] as estimated from the Intercensal Survey and Population Census 1980. The mortality rates, in general, were lower than mortality rates from other studies. These differences could have been influenced by the local health status of the sample area, rather than the different time period, i.e. this survey was conducted in 1982 - 1983, Household Survey was conducted in 1980[3], estimated data from Intercensal Survey and Population Census was for the period 1975 - 1980.[1]

Reliability of the data was confirmed by the follow up done in 1984, which showed an infant mortality of 71 %. live births. Comparing to the infant mortality rate 75.0 %. live births, the difference was not significant ($p < 0.5$).

Neonatal death rate (newborns aged less than 1 month) was 38.3 %. live births, which was lower compared to the neonatal death rate 51.6 %. live births in Ujung Berung 1980[5]

This prospective study was conducted in a small sample population, therefore the mortality rates might not be representative, but the most important thing from the study, was to find the mortality pattern in the various age groups.

Infectious diseases were the major causes of deaths in infants, among which tetanus was the main cause of newborn deaths. Among infants aged less than 1

month, tetanus was the main cause of 1574.5 deaths per 100.000 live births as compared to 1186.5 deaths per 100.000 live births from the Household Health Survey 1980.

Tetanus among newborns were transmitted through the umbilical cord. Several routes of transmission were observed, such as the use of unsterilised instruments to cut the umbilical cord, and the use of herbs of other materials instead of alcohol for the treatment of the umbilical cord.

Traditional birth attendants and pregnant mothers should be given health education, especially on the care and treatment of the umbilical cord. But the most effective way to prevent tetanus neonatorum is by giving tetanus immunization to all pregnant women and further to all women at child bearing age.

Diarrheal diseases were the major causes of death among infants aged 1 - 11 months. This disease is transmitted through fecal oral route, which is much related to food hygiene and feeding habits.

Health education on personal hygiene and sanitation should be emphasised for the community, besides improvement of environmental sanitation. But changing peoples habit will take a long time, while improving treatment method by the use of oral rehydration for diarrheal cases, will reduce case fatality rate considerably.

Typhoid fever was another major cause of deaths which caused 225.4 deaths per 100.000 children age 1 - 4 years.

Nutritional deficiencies were not the main cause of death, but they were observed as an associated cause of death among infants aged 1 - 11 months and children 1 - 4 years covering 225.4 per 100.000 children.

Therefore the nutritional status should be improved together with the disease treatment.

Death from diphtheria, whooping cough and measles were frequent among infants aqed 1 - 11 months, and these could be prevented by immunization. DPT vaccination covered only 15 - 20 %. of the target population which should be improved. Immunization against measles should have been provided but it is still limited to certain areas, and does not cover the area under study.

Meningitis was a serious problem among infants in the study area. It would be necessary to investigate the agent causing the disease when not investigated.

Pneumonia was a major cause of death in infants and children. Improving the physical condition of the infants and children, and providing more assessible and effective treatment, would reduce the case fatality rate.

SUMMARY

Mortality study was conducted prospectively in Sukabumi. The crude death rate was 10.7 %., infant mortality rate 75 %. and death rate among children under 5 years of age was 31.7 %. . The main causes of deaths were described according to the age groups.

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REFERENCES

1. Soemantri, S.; Pola Perkembangan dan Perbandingan antar daerah Angka Kematian Bayi. Seminar Tingkat Kematian Bayi di Indonesia, Biro Pusat Statistik, Februari 1 - 3, 1983. p. 173 - 192.
2. Sistem Kesehatan Nasional. Departemen Kesehatan Republik Indonesia, 1982.
3. Budiarso, L. Ratna; Putrali, J. dan Muchtaruddin; Survey Kesehatan Rumah Tangga Badan Penelitian dan Pengembangan Kesehatan, 1980.
4. Djaja, Sarimawar; Budiarso, L. Ratna and Widhodo, R; Study Angka Kematian Bayi dengan Berat Badan Lahir Rendah di Sukabumi. Laporan Akhir. Badan Penelitian dan Pengembangan Kesehatan, 1984.
5. Alisyahbana, Anna dan kawan-kawan. Perinatal Mortality and Morbidity Survey and Low Birth Weight. Final Report V. the Pregnancy Outcome in Ujung-Berung, West Java. Laporan Akhir. Badan Penelitian dan Pengembangan Kesehatan, 1984.

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